Exercises - Problems Sheet # 1: Functions (Recursion)

Spring 2024

No. Of Questions: 7 **No. Of Pages: 2**

Answer the following:

1) Repeat the problem no. 11 in **Sheet#0** but with an 'Exit' option; that is, the program allows the user to enter new values and choose the required operations until the user chooses to exit.

2) Repeat the problems from 5 to 16 in **Sheet#0** using functions, and you should call them from the main. The functions should return a value to the main and the main is responsible for printing the output.

3) Write a program that will:
- Prompt the user to input ten integer values.
- Calculate the smallest and the greatest of those values.
- Call a function to calculate the difference between those smallest and greatest values.

4) Write a C program to find the sum of the first n natural numbers using recursion.
Note: Positive integers are known as natural numbers.

5) Write a C program to check whether a number is a prime number or not, by using recursion.

6) Write a C program to reverse a string, by using recursion.

7) What does the following program do?

5.43 What does the following program do?

```c
#include <stdio.h>

int mystery( int a, int b ); /* function prototype */

/* function main begins program execution */
int main( void )
{
   int x; /* first integer */
   int y; /* second integer */

   printf( "Enter two integers: " );
   scanf( "%d%d", &x, &y );

   printf( "The result is %d\n", mystery( x, y ) );
   return 0; /* indicates successful termination */
} /* end main */

/* Parameter b must be a positive integer
   to prevent infinite recursion */
int mystery( int a, int b )
{
   /* base case */
   if ( b == 1 ) {
      return a;
   } /* end if */
   else { /* recursive step */
      return a + mystery( a, b - 1 );
   } /* end else */
} /* end function mystery */
```

With our best wishes;